Claims

1. Method for binding nucleic acids to a solid phase
characterized in that
a solution containing nucleic acids is contacted with a solid phase which has hydrophobic and hydrophilic groups on its surface in the presence of a salt and polyethylene glycol, whereby the nucleic acids are reversibly and sequence-unspecifically bound to the surface.

2. Method as claimed in claim 1,
characterized in that
the said surface has alkyl or aryl groups as hydrophobic groups.

3. Method as claimed in claim 2,
characterized in that
the alkyl groups are selected from C_8 alkyl, C_{18} alkyl and mixtures thereof.

4. Method as claimed in one of the claims 1 to 3,
characterized in that,
the surface has hydroxyl groups as hydrophilic groups.

5. Method as claimed in one of the previous claims,
characterized in that
the solid phase is solid particles.

6. Method as claimed in one of the previous claims,
characterized in that
the solid phase is magnetic.

7. Method as claimed in one of the previous claims,
characterized in that
the salt is an alkali, alkaline earth or/and ammonium halide.

8. Method as claimed in one of the previous claims,
characterized in that
a polyethylene glycol having an average molar mass of 1000 to 20000 g/mol is added.

9. Method as claimed in one of the previous claims,
characterized in that
the salt is used at a final concentration of 5 mmol/l to 4 mol/l.

10. Method as claimed in one of the previous claims,
characterized in that
polyethylene glycol is used at a final concentration of 5 % by weight to 40 % by weight.

11. Method as claimed in one of the previous claims,
characterized in that
the nucleic acid is DNA.

12. Method as claimed in one of the previous claims,
characterized in that
the nucleic acid is amplification products.

13. Method as claimed in one of the previous claims,
characterized in that
single-stranded or double-stranded nucleic acids are selectively bound.

14. Method as claimed in one of the previous claims,
characterized in that
the nucleic acid is selectively bound with regard to size in a range of ≥ 5 nucleotides to ≤ 1000 nucleotides.

15. Method for isolating or/and purifying nucleic acids comprising the steps
(a) providing a solution containing nucleic acids,
(b) contacting the solution containing nucleic acids with a solid phase which has hydrophobic and hydrophilic groups on its surface in the presence of a salt and polyethylene glycol whereby the nucleic acid is reversibly and sequence-unspecifically bound to the surface
(c) separating the solid phase from the solution and
(d) optionally detaching the nucleic acid from the solid phase.

16. Method as claimed in claim 15,
characterized in that
the solid phase is magnetic and the solid phase is separated from the solution by magnetic means.

17. Method as claimed in claim 15 or 16,
characterized in that
the solid phase separated in step (c) is washed with a buffer solution which detaches impurities bound to the solid phase but not the nucleic acids bound to the solid phase.

18. Method as claimed in one of the claims 15 to 17,
characterized in that
the nucleic acid is detached in step (d) by means of an elution solution.

19. Method as claimed in one of the claims 15 to 18,
characterized in that
the nucleic acid detached from the solid phase and the solid phase are separated by magnetic means.

20. Method as claimed in one of the claims 15 to 19,
characterized in that
the nucleic acid obtained is subjected to a mass spectrometric analysis.

21. Method for determining the nucleotide sequence of a nucleic acid comprising the steps:

(a) binding a nucleic acid to a solid phase according to the method of claim 1 and

(b) sequencing the nucleic acid by known methods.

22. Method as claimed in claim 21, additionally comprising the step

(c) purifying the sequencing products.

23. Method for synthesizing nucleic acids comprising the steps

(a) binding a nucleic acid to a solid phase according to the method of claim 1 and

(b) extending the nucleic acid by at least one nucleotide by known methods.

24. Method for detecting an analyte in a sample,

characterized in that

a solution containing nucleic acids is contacted with a solid phase which has hydrophobic and hydrophilic groups on the surface in the presence of a salt and polyethylene glycol whereby the nucleic acids are reversibly and sequence-unspecifically bound to the surface, subsequently this solid phase is contacted with the sample and the analyte is detected by means of the binding to the bound nucleic acids.

25. Reagent kit for carrying out a method as claimed in one of the claims 1 to 24 comprising:

(a) a binding buffer which contains a salt and a polyethylene glycol and

(b) a solid phase which has hydrophobic and hydrophilic groups on its surface.

26. Reagent kit as claimed in claim 25,
additionally comprising,
(c) an elution buffer that can be used to detach the nucleic acid bound to this surface,
(d) a washing buffer which can be used to separate impurities bound to the solid phase.

27. Method for binding nucleic acids to a solid phase
characterized in that
a solution containing nucleic acids is contacted with a solid phase which comprises a hydrophilic water-containing polymer matrix in the presence of a dehydrating reagent whereby the nucleic acids are reversibly and sequence-unspecifically bound to the solid phase.

28. Method as claimed in claim 27,
characterized in that
the polymer matrix contains a hydrophilic water-soluble polymer.

Sub 04 29. Method as claimed in claim 27 or 28,
characterized in that
the polymer matrix contains a hydrophilic organic polymer.

30. Method as claimed in one of the claims 27 to 29,
characterized in that
the hydrophilic polymer matrix comprises a polysaccharide.

31. Method as claimed in claim 30,
characterized in that
it is a polysaccharide with terminal hydroxyl groups.

Sub 05 32. Method as claimed in claim 30 or 31,
characterized in that
the polysaccharide is dextran.

33. Method as claimed in one of the claims 27 to 32,
characterized in that
the dehydrating reagent is selected from the group comprising salts and polyethylene glycol or mixtures thereof.

34. Method as claimed in claim 33,
characterized in that
a chaotropic salt buffer is added as the dehydrating reagent.

35. Method as claimed in one of the claims 27 to 34,
characterized in that
the hydrophilic water-containing polymer matrix forms an envelope polymer around a magnetic core.

36. Method as claimed in claim 35,
characterized in that
the magnetic core is magnetite.

37. Method for isolating or/and purifying nucleic acids comprising the steps
(a) providing a solution containing nucleic acids,
(b) contacting the solution containing nucleic acids with a solid phase which comprises a hydrophilic water-containing polymer matrix in the presence of a dehydrating reagent whereby the nucleic acid is reversibly and sequence-unspecifically bound to the solid phase,
(c) separating the solid phase from the solution and
(d) optionally detaching the nucleic acid from the solid phase.

38. Method as claimed in claim 37,
additionally comprising one or more features of claims 16 to 20.

39. Method for determining the nucleotide sequence of a nucleic acid comprising the steps:

(a) binding a nucleic acid to a solid phase according to the method of claim 27 and

(b) sequencing the nucleic acid by known methods.

40. Method as claimed in claim 39, additionally comprising the step:

(c) purifying the sequencing products.

41. Method for synthesizing nucleic acids comprising the steps:

(a) binding a nucleic acid to a solid phase according to the method of claim 27 and

(b) extending the nucleic acid by at least one nucleotide by known methods.

42. Method for detecting an analyte in a sample,

characterized in that

a solution containing nucleic acids is contacted with a solid phase which comprises a hydrophilic water-containing polymer matrix in the presence of a dehydrating reagent whereby the nucleic acids are reversibly and sequence-unspecifically bound to the solid phase, subsequently the solid phase is contacted with the sample and the analyte is detected by means of the binding to the bound nucleic acids.

43. Reagent kit for carrying out a method as claimed in one of the claims 27 to 42, comprising:

(a) a binding buffer which contains a dehydrating reagent and

(b) a solid phase which comprises a hydrophilic water-containing polymer matrix.

44. Reagent kit as claimed in claim 43 additionally comprising:

(c) an elution buffer which can be used to detach nucleic acids bound to the surface and

(d) a washing buffer which can be used to separate impurities bound to the solid phase.